

Claims

- [c1] Apparatus for use in perforating a wellbore, the apparatus comprising:
an adaptor adapted to receive and mount a shaped charge of a selected size into a loading tube of a perforating gun, the loading tube formed to hold one or more shaped charges of a size larger than the selected size.
- [c2] An adaptor, comprising:
a holder mechanism adapted to receive a first shaped charge, the first shaped charge having a selected size;
and
a mounting mechanism adapted to connect the first shaped charge to a loading tube, the loading tube formed to receive a second shaped charge having a selected size larger than that of the first shaped charge.
- [c3] The adaptor of claim 2, wherein the loading tube comprises:
a circular opening having a predetermined diameter; and
a jacket having an outer surface formed to engage the circular opening and an inner surface.
- [c4] The adaptor of claim 3, wherein the holder mechanism

comprises:

a housing assembly, having an upper section and a lower section connectable together to define an outer surface and an inner bore, the outer surface adapted to engage the inner surface of the jacket and having a selected size approximately the same as the size of the second shaped charge, the inner bore adapted to receive the first shaped charge.

[c5] The adaptor of claim 4, wherein the mounting mechanism comprises:

a recess formed in the outer surface of the housing assembly; and

a protruding element formed on the inner surface of the jacket, the protruding element adapted to engage the recess in the housing assembly to lock the housing assembly and the first shaped charge to the jacket of the loading tube.

[c6] The apparatus of claim 4, wherein the first shaped charge further comprises:

a casing having a proximal end and a distal end;

a primer column arranged on the proximal end of the casing;

an explosive charge arranged between the proximal end and distal end of the casing; and

a liner arranged on the distal end of the casing.

- [c7] The adapter of claim 6, further comprising:
an opening formed in the upper section of the housing assembly to expose the distal end of the casing of the first shaped charge.
- [c8] The adapter of claim 6, further comprising:
an opening formed in the lower section of the housing assembly to receive a detonating cord and to establish communication between the detonating cord and the primer column on the proximal end of the casing of the first shaped charge.
- [c9] The apparatus of claim 3, wherein the first shaped charge further comprises:
a casing having a proximal end and a distal end;
a primer column arranged on the proximal end of the casing;
an explosive charge arranged between the proximal end and distal end of the casing; and
a liner arranged on the distal end of the casing.
- [c10] The adapter of claim 9, wherein the holder mechanism comprises:
at least one rib formed on the inner surface of the jacket to support the proximal end of the casing.
- [c11] The adapter of claim 9, wherein the mounting mecha-

nism comprises:

a recess formed in the casing of the first shaped charge;
and

a protruding element formed on the inner surface of the jacket, the protruding element adapted to engage the recess in the casing of the first shaped charge to lock the first shaped charge to the jacket of the loading tube.

[c12] The adapter of claim 11, further comprising:
an opening formed in the jacket to receive a detonating cord and to establish communication between the detonating cord and the primer column on the proximal end of the casing of the first shaped charge.

[c13] A method for use in wellbore perforating operations, comprising:
using an adapter to mount a shaped charge of a selected size into a loading tube of a hollow carrier perforating gun,
wherein the loading tube is designed to hold one or more shaped charges of a size larger than the selected size.

[c14] A method for loading a small shaped charge in a standard loading tube of a perforating gun, comprising:
inserting the shaped charge into an adapter,
installing the adapter into the loading tube.

[c15] A charge holder for use in well perforation operations, the charge holder comprising:
a housing assembly, having an upper section and a lower section connectable together to define an outer surface and a bore therein, the outer surface adapted to engage a jacket in a loading tube, the inner bore adapted to receive a shaped charge; and
a fastening mechanism for connecting the housing assembly to the jacket of the loading tube.

[c16] The charge holder of claim 15, further comprising:
a groove formed in the lower section of the housing assembly to receive a detonating cord; and
an opening formed in the lower section of the housing assembly to establish communication between the shaped charge and the detonating cord.

[c17] The charge holder of claim 15, wherein the fastening mechanism comprises:
a recess formed in the outer surface of the housing assembly; and
a protruding element formed on the jacket, the protruding element adapted to engage the recess in the housing assembly to lock the housing assembly to the jacket of the loading tube.

[c18] A jacket for holding a small shaped charge in a standard loading tube of a perforating gun, the jacket comprising: an inner surface having a plurality of ribs formed thereon, the ribs adapted to support the small shaped charge; and a protruding element formed on the inner surface of the jacket, the protruding element adapted to engage a recess formed in the small shaped charge to lock the small shaped charge to the jacket.

[c19] The jacket of claim 18, further comprising: a groove formed in the jacket to receive a detonating cord; and an opening formed in the jacket to establish communication between the small shaped charge and the detonating cord.

[c20] A shaped charge holder, comprising: a housing having an outer surface, an inner bore, and an opening therein for communicating with the inner bore, the outer surface adapted to engage a jacket in a loading tube, the inner bore adapted to receive a shaped charge; and a fastening mechanism for connecting the housing assembly to the jacket of the loading tube.